



**TRAUMA RADIOLOGY 2024** 

# Trauma: From the Past to the Future



Fausto Labruto Associate Professor Director of Emergency Radiology



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World Health Organization							
List of Chapters	Chapter XX						
Chapter Introduction List of Blocks Previous Block	External causes of morbidity and mortality (V01-Y98)						
Next Block	Accidents (V01-X59)						
	Air and space transport accidents (V95-V97)						
	V95       Accident to powered aircraft causing injury to occupant         Includes:       collision with any object, fixed, movable or moving       }         crash       }         explosion       }         fire       }         forced landing       }						
Search ICD-10 space Full search OK Help Move to ICD code:	<ul> <li>V95.0 Helicopter accident injuring occupant</li> <li>V95.1 Ultralight, microlight or powered-glider accident injuring occupant</li> <li>V95.2 Accident to other private fixed-wing aircraft, injuring occupant</li> <li>V95.3 Accident to commercial fixed wing aircraft, injuring occupant</li> <li>V95.4 Spacecraft accident injuring occupant</li> <li>V95.8 Other aircraft accidents injuring occupant</li> <li>V95.9 Unspecified aircraft accident injuring occupant</li> <li>Aircraft accident NOS</li> <li>Air transport accident NOS</li> </ul>						







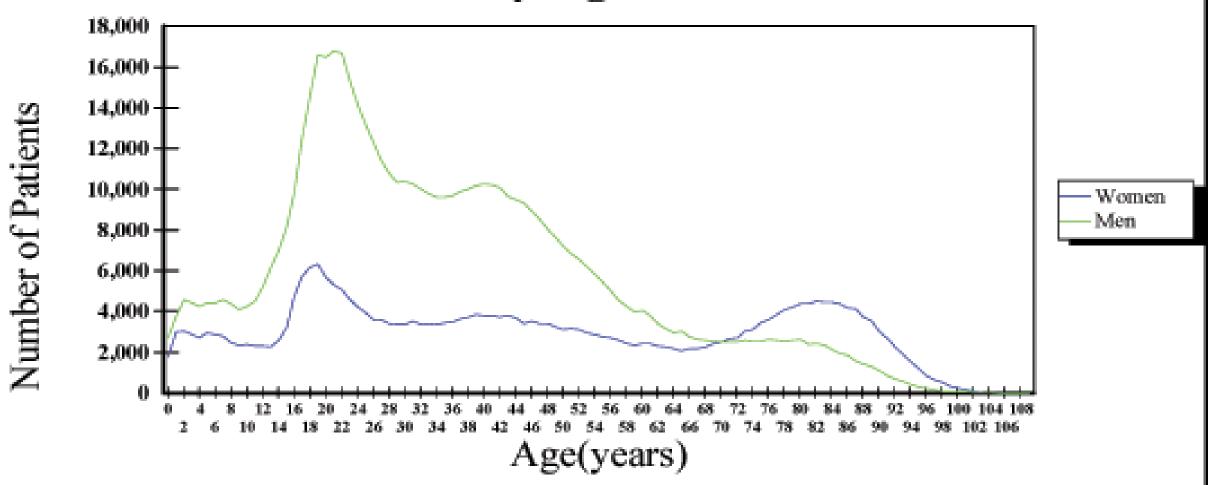


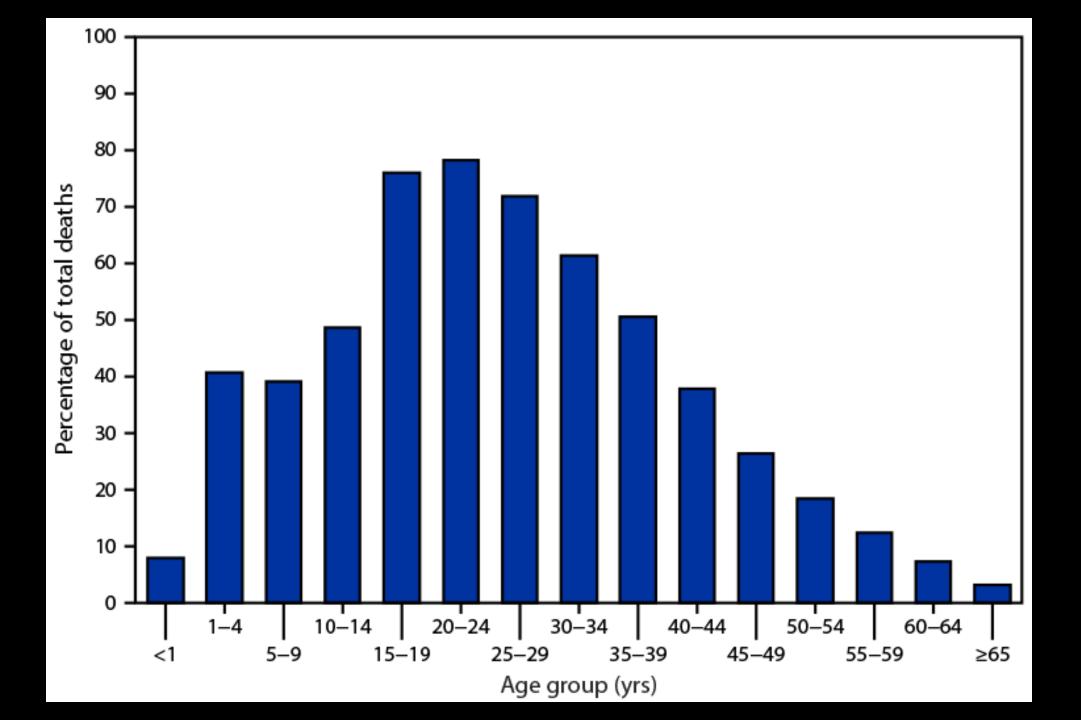






## **Patients by Age and Gender**





Nestor son of Neleus (...) mount your chariot at oncertake Machaon with you and drive your horses to the ships as fast as you can. A physician is worth more than many other men put together, for he can cut out arrows and spread healing herbs.

Iliad Book XVI verse 516

AMBULANCE

MBULANCE

"There is a golden hour between life and death. If you are critically injured you have less than 60 minutes to survive."

## R. Adams Cowley



The Trauma **Golden Hour** A Practical Guide Adonis Nasr Flavio Saavedra Tomasich Iwan Collaco **Phillipe Abreu** Nicholas Namias Antonio Marttos Editors

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ould begin. Later, sitting around a table with some emergency medicine physicians, the concept of the Golden Hour came up. I learned from a doctor who trained at the

drinks in a Baltimore bar. Today, the concept of the Golden Hour has evolved I learned from into a fundamental tenet of EMS. The concept of the Golden Hour justifies much of the current EMS and traua doctor who ma system, not just in this country, but around the world. trained at the It is the theoretical basis for such concepts as "load and University of go" (or "scoop and run," depending which part of the country you are from). It also forms the fundamental basis Maryland for aeromedical transport and trauma center designation. that the whole Numerous federal and state grants have been provided to determine how best to deliver patients to trauma centers idea of the within the magical Golden Hour. All of the EMS text-Golden Hour books, including my own, stress the concept of the Golden Hour. We speak and write of it with authority, was subposedly assuming that it is scientific fact drafted on a It seems intuitive that the sooner trauma patients are cocktail napkin

delivered to definitive care, the better their chances of survival. But this is not what is at question here. What is not over drinks in a clear is whether the patient must arrive within an hour. Baltimore bar. Could it be two hours? Could it be 30 minutes? E. Brooke Lerner, EMT-P, and Ronald M. Moscati, MD, with the Department of Emergency Medicine at the State

University of New York, Buffalo, decided to look at the medical literature behind the concept of the Golden Hour. In their landmark paper, The Golden Hour: Scientific Fact or Medical Urban Legend?, published in the July 2001 issue of Academic Emergency Medicine, they performed an

#### The Golden Hour: Fact or Fiction?

his whole idea of the so-called "Golden Hour" has always bothered me a little. As a resident, I remember seeing trauma patients rushed to the emergency department by EMS only to lie around for several hours while the surgeons operated on others. Even while staffing a large urban trauma center, I noted that it was uncommon for more than one or two operating rooms to be available during the evening and night hours. I wondered, if EMS has the "Platinum Ten Minutes" and the emergency department has the "Golden Hour," what do the hospitals and surgeons have? "The Silver Day" or fact, many of the articles that discussed the Golden Hour

exhaustive search of the medical literature supporting the concept of the Golden Hour. They were able to trace the idea back to famed trauma surgeon R Adams Cowley MD, founder of the Shock Trauma Center at the University of Maryland in Baltimore. Dr. Cowley died in 1991, but his writings and documents are archived at the University of Utah. In reviewing the literature, including Dr. Cowley's writings and archives, Lerner and Moscati were unable to find a single scientific article that either supported or refuted the concept of the Golden Hour. In actually referenced other

articles where there was no mention of th Golden Hour whatsoever. They summarized "The intuitive nature of the concept and the pres ize of those who original nally expressed it resulted in its widespread applica tion and acceptance Despite the lack of defin itive scientific evidence, numerous research stud ies and requests for fund ing are based on achiev ing the Golden Hour for all trauma patients and take for

granted that time always matters." It is not for me to determine whether the Golden Hour University of Maryland that the whole idea of the Golden actually exists. Certainly the concept of rapidly getting the Hour was supposedly drafted on a cocktail napkin over patient to the hospital following trauma makes a lot of

sense. But, are we risking the lives of EMS personnel in speeding ground ambulances and aeromedical helicopters as they strive to get the trauma patient to a hospital within the Golden Hour when it may not actually exist? Do they risk their lives only to have the patient lie around the emergency department for a prolonged period of time waiting for a surgical team or for an operating suite to become available?

It is incumbent upon us all in emergency medicine and EMS to determine what prehospital time interval is most appropriate. It may be an hour, But, whatever it is, it should be supported by sound, scientific evidence. With a shrinking healthcare dollar, we must be able to prove that everything we do is scientifically and ethically sound. The Golden Hour may not be.

#### Bibliography

□ American College of Surgeons, Advanced Trauma Life Subtor Course: Student Manual, 1995

□ Lemer EB, Moscati RM. The Golden Hour: Scientific Fact or Medical "Urban Legend"? Acad Emerg Med 8(7):758-760, 2001.

Bryan E. Bledson, DO, EACEP, EMT-P, is an emergence physician, EMS author and former paramedic. His writings include Paramedic Care: Principles and Practice, Paramedic Emergency Care and Anatomy and Physiology for Emergency Care. He is a frequent steaker at FMS conference bere and abroad. He resides in Midlothian, TX.

#### Rapports écrits.

Du shock traumatique dans les blessures de guerre.

I. — De la distinction dans les états de shock chez les grands blessés, du shock nerveux hémorragique ou infectieux,

par M. le D' MOULINIER.

Rapport de M. E. QUÉNU.

II. — Du rôle joué par l'hémorragie dans l'apparition du shock traumatique,

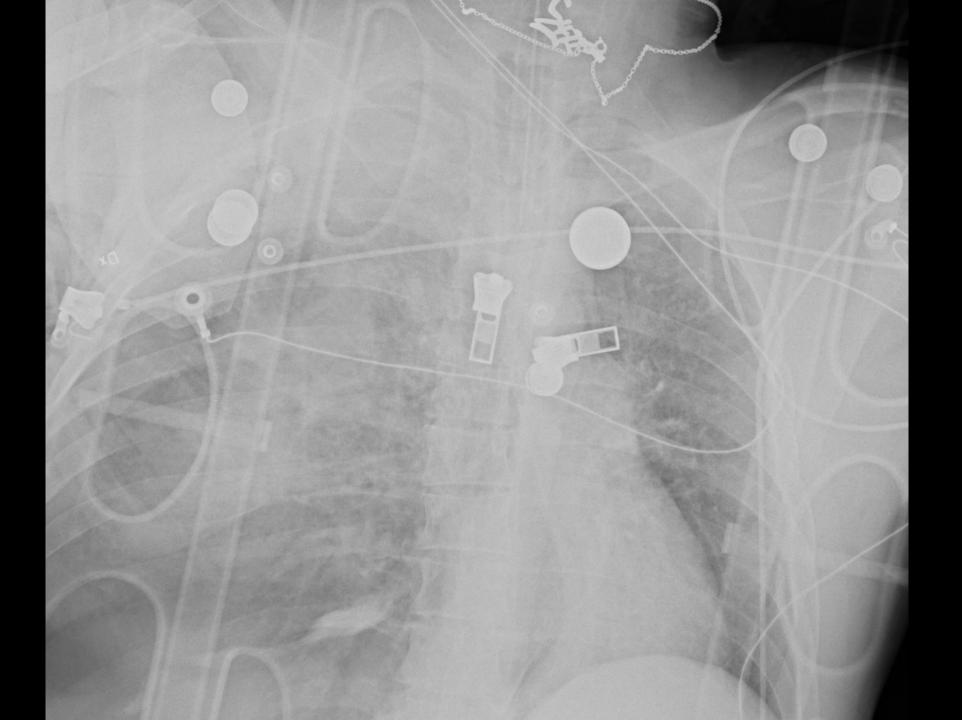
> par M. P. SANTY, Prosecteur à la Faculté de Lyon.

Rapport de M. E. QUÉNU.

### La mortalité globale est de :

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11	p.	100	a.	la	2°	he	ure,	12-24
12	p.	100	à	la	3.	he	ure.	
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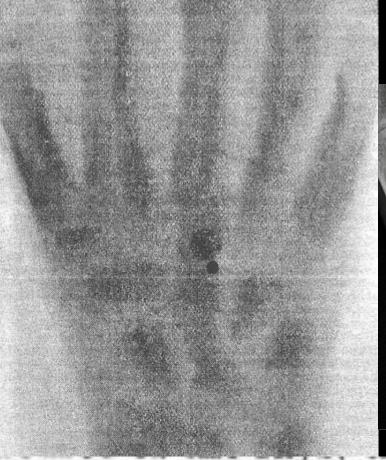
#### THE DISCOVERY OF A BULLET LOST IN THE WRIST BY MEANS OF THE ROENTGEN RAYS.

BY ROBERT JONES, F.R.C.S. EDIN., HONORARY SURGEON TO THE ROYAL SOUTHERN HOSPITAL, LIVERPOOL;

AND OLIVER LODGE, F.R.S.,

PROFESSOR OF PHYSICS, UNIVERSITY COLLEGE, LIVERPOOL.

A BOY aged about twelve years was brought to me by Dr. Simpson of Waterloo, Liverpool, having shot himself in the left hand just above the deep palmar arch. The wound





ing from each point of the glass in all directions. The boy was comfortably seated at a table with his palm down on an aluminium-protected Edwards' isochromatic half-plate, nine inches vertically below the vacuum tube, and rather more than two hours' exposure was given. The coil used was an



### A Prospective Study of Surgeon-Performed Ultrasound as the Primary Adjuvant Modality for Injured Patient Assessment

Rozycki, Grace S. MD, FACS; Ochsner, M. Gage MD, FACS; Schmidt, Judy A. RN, DNSc; Frankel, Heidi L. MD; Davis, Thomas P. MC, USNR; Wang, Dennis MD; Champion, Howard R. FRCS (Edin)

Author Information⊗

The Journal of Trauma: Injury, Infection, and Critical Care 39(3):p 492-500, September 1995.

Acta Chir Scand 137: 653-657, 1971

### ULTRASONIC SCANNING IN THE DIAGNOSIS OF SPLENIC HAEMATOMAS

#### J. Kvist Kristensen, B. Buemann and E. Kühl

From Department of Surgery H (Heads; P. A. Gammelgaard, F. R. Mathiesen & B. L. Sørensen), Department of Surgery S (Head: A. Gammeltoft), and the Department of Radiology (Heads: O. Petersen, M. Eiken & S. Brünner), Gentofte Hospital, DK 2900 Hellerup, Denmark





# ABC

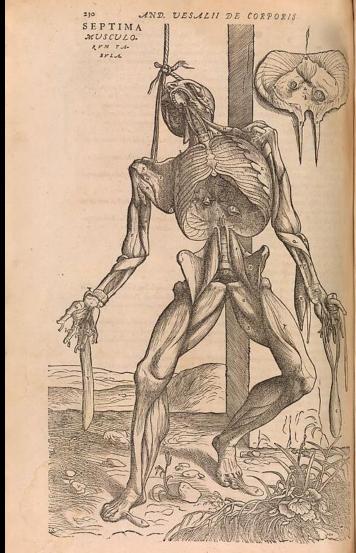
### CARDIOPULMONARY CEREBRAL RESUSCITATION BY PETER SAFAR

A MANUAL FOR PHYSICIANS AND PARAMEDICAL INSTRUCTORS, PREPARED FOR THE WORLD FEDERATION OF SOCIETIES OF ANAESTHESIOLOGISTS.





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#### HUMANI FABRICA LIBER 11 SEPTIMAE MVSCVLORVM TAbulæ characterum Index.

S # 7 7 1 31 AB mufculorum tabule corpus laxato fine, à quo inter pingendu pendebat, in posseriora tantion procida, quantion refecto cam peruoneo, & omnibus qua illo amplexantur, uidendo fepto transverso suffi en quod etuam in prafenti tabula ad finiliram ea forma appillum cerus, qua exelium, parietig, fuo lentore ha reni, nobis apparun. Quo minus autem dextra fcapula, effracta ale rus deorfum decumberet, allam funicula it a fuffendimus, ut univerfum infins causem in confbellu fit.

- A Guryulio, a palati termino propenden, inferiori inferiori maxilla prorfus amota. B Aliquot cernicis nertebrarum corpora anteriori fede, qua mufculu non obcejuntur, fe hic ostendum.
- GD Primum par muGularum darfum mayennium.
- E Stomacha feu gule hic prafelle pars.
- F Afer a arteria flomacho influara pars, ble quoq inxeta insulum à reliqua caudicis fui porione liberata. Caterium uafa utring ad affera arteria latera occurrentia, foporales funt arteria, cum internis ingularions ucnis, & fexto nernorum cerebri pari,
- G Mulculus alter fecundi para dorfirm monentium. H Scapulan mouentium tertine, qui in dextro latere transellus est.
- I Mufculus brachium mouentium quintue, inter elatiorem feapule collam, & fuperioris ipfius proceffus radi-
- F Mufculus brachium mouentium fextus, totam fapula cauam anteriorem ue occupans fedem. Huius inferio K. K infignitur, reliquag, ipfins forma ex fcapula imagine deprehenditur. quanquam fi prafentis mufculi trian-
- gularem figuram wolwern confinuere, licebu K.L & L fimul conferre.
- L. L. Mafeulus ther acem mouentium focundus, olds fupersorbus cositis manus modo inferens. M Brachium agentium terrium, & ab inferioris (capida costa, suxta bafis (capida inferiorem angulum enatus. N.N. Musculus cubitum extendentium, cuius initium superiori N insignitum, à scapula educitur.
- O Portio tendinis mufculi brachium monentium quarti.
- P Cubitum fledentium poflerior, qui totus ferè hic est confricuut.
- Q Radium in pronum conflituentium fupe
- R, R Anterior cubitum flectentium, qui ab ofibus, unde initium duxit, liberatus, ac à brachio aunifies, à fua dependet infertione.
- S Radius.
- T Una
- U Lipamentuminter vadium & ulnam, audinuicem dehilcunt, intercedent,
- X Radium in pronum moventium inferior mufculus, properodum quadratus,
- 7,7 A dextro radio ( qui cum uninerfamanu magu quam finitira attollitur ) dependet à fua infertione langior radium in fupinum ducentium mufculus.
- a Minor primum pollices os flectentium mufculus, fuo inicio liberatus, ab illo cui inferitur offe tantum pendet.
- 1, 2, 3 Tribus his characteribus musculi norantur secundum pollicis os flettentes.
- b Dependet is fua infertione mufculus tertium pollicis internodium flettens
- e Mufeulus terry quatuor dignorum offu flexus autor, à cubuto refettus, deorfum eft reflexus. Hunc fedulo intuebere, quisd illus tendimbus mufculi attendantur, quatuor digitos pollici adducentes : quorum is qui indicem mo
- d. wet, d informitur, perinde ac reliqui tres, do infertione dependents. Quanetiam tendinum mulculi fecundum qua-
- e. tuor diguorum os fletlentis portunes hic adhuc feruantur, ac portuon quidem máici propria e mferipfi: tendini f. autemiteriumindicii os fiellenti, f. Ceteriumin dextra manu dillorum mufculorum duntaxat confocuentur
- p.h. infertiones.ac g in induce infertionem indicat mulcult indicem pollici adducentu; h infertionem tendinii ficun-
- 1. dum indicis os fletlentus infertionem tendinis, qui terty eius dopit offie flexioni praficitur.
- Prajentis tabula thorax, quiod ad intercollades feellat mujculos, pracedentis tabula thoraci refondet : unde etiam charafleribus non uenit obliterandus.
- ☆ Septum transfersfum, cuius membraneus circulus în septe extra corpus expanso, & suo mucore parieti azgluti-.I.m.n. nato, circufeributur k. I.m.n.nusduero exterius has charatteres ambu, & forst excitit, fibring merflingutur,
- 0, p. carneam fepti partem effe putato. 0, p Duo ligamenta, feu tendines fepti, vertebrarum in lumbus confistenq. tum corportion inferti. q Septi fciffura, qua id uertebrarum incumbit corportion, ac magnam arteriam,
- uenama, consugu expertem transmutit, au illu cedu, quarum orificia q in corpore huius tabula positum indir. cas, quemalmolum & arteriar amos in feptum excurretes. r Foramen fepti, flomacho mam prebens, qui f. etiam r in corpore infiguntur. f Foramen in fepto trafuerfo, nena cana candus paratu, qui in corpore f notatus conflicitur.

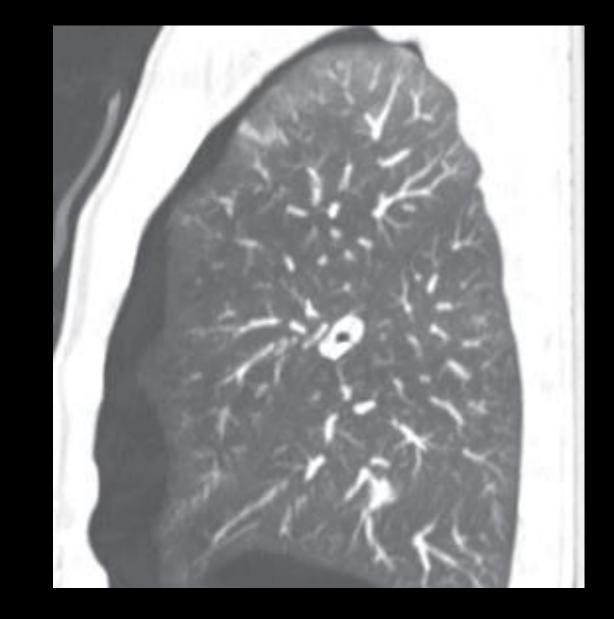
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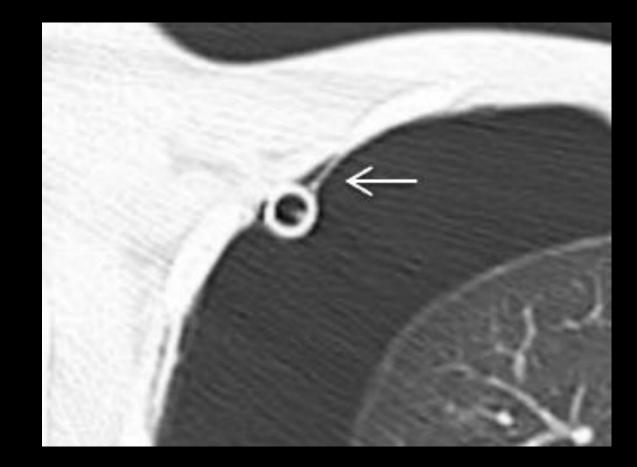
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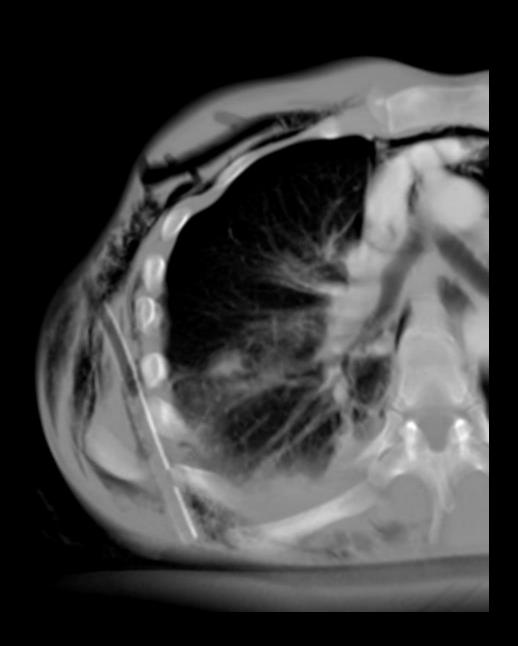




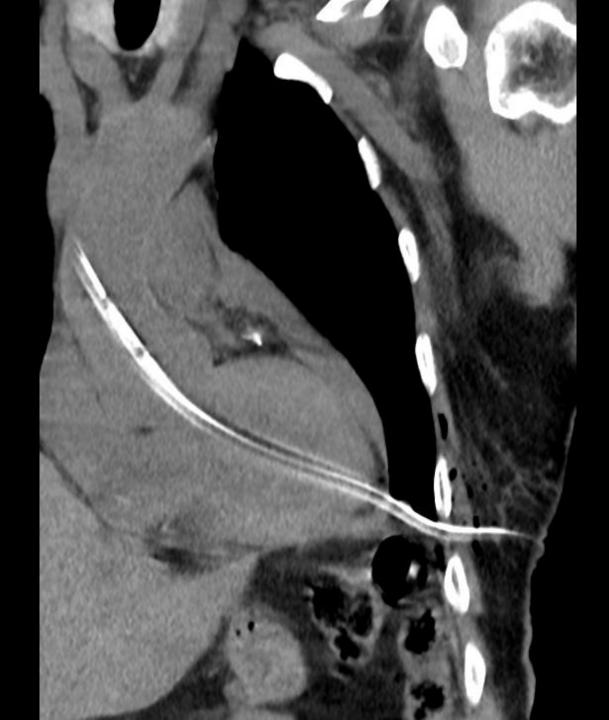










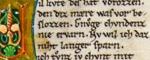


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If you encounter a man having a wound in his breast, penetrating to the bone with perforation of the manubrium of the sternum, you should press the manubrium of the sternum with your fingers, even though he shudders exceedingly

Case 40, Edwin-Smith papyrus

dax er fich palde wapende drin. n wil er werbn niwen pin. Oo der freden flohtech man. het alfin harnafe an. er fatelez orf mit finer hant. felt wit fper bereit er vant. man horte fine refe finorgenf oljagn. de er dannen fetet de begyndeh tagn. het vore for def hat Obrozzei.



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There lay a man pierced through, with his blood rushing inward (...)

*"He is not mortally wounded. The blood is only pressing on his heart.".* 

He grasped a branch of the linden tree, slipped the bark off like a tube (...) and inserted it into the body through the wound.

Then he bade the woman to suck on it until blood flowed toward her. The hero's strength revived so that he could speak and talk again.

Von Eschenbach, Parzival

# ABC





## χειρὶ δ' ἑλὼν ἐπίεζε βραχίονα "... And holding with his hand he pressed on the arm"

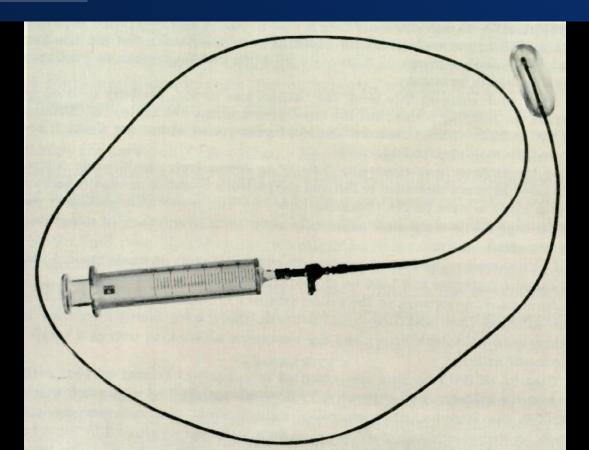
Homer, Iliad, Book XVI verse 510





# Use of an intra-aortic balloon catheter tamponade for controlling intra-abdominal hemorrhage in man

Lieutenant Colonel Carl W. Hughes











# fausto.labruto@unilabs.com